

Notice of Allowability

Application No.

09/996,451

Applicant(s)

LAKE ET AL.

Examiner

Peter-Anthony Pappas

Art Unit

2671

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 9/2/2004.
2. ☒ The allowed claim(s) is/are 8,11,19,22,29 and 31-52.
3. ☒ The drawings filed on 12 August 2004 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.


Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☒ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☒ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date 9/2/04
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date _____.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.


ALMIS H. JANKUS
PRIMARY EXAMINER

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Ruth J. Ma on 12/22/04.

2. The following changes to the drawings have been approved by the examiner and agreed upon by applicant: element 903 of Fig. 9 should read "Determine cross product of vector and eyepoint vector". In order to avoid abandonment of the application, applicant must make these above agreed upon drawing changes.

The application has been amended as follows:

- Page 3, lines 14-17 of the specification:

The 3D data also includes a ~~normal~~-vector to each face, which is also positioned in (x,y,z) coordinate space. For example, in Fig. 3, polygon 24 includes face 25, vertices 26 to 28, and ~~normal~~-vector ("N") 29.

- Page 4, lines 22-23 of the specification:

The eyepoint vector is the vector from the preset point to the face of a target polygon. An eyepoint vector 36 (pointing out of the page) and a ~~normal~~-vector 37 are shown in Fig. 1.

- Page 5, lines 3-7 of the specification:

In 405, process 30 determines the vector dot product of ~~normal~~-vector 44 (to polygon face 45) and eyepoint vector 46. In 406, process 30 determines the vector dot product of ~~normal~~-vector 47 (to polygon face 49) and eyepoint vector 46.

- Page 8, paragraph 3 to page 9, paragraph 1 of the specification:

To determine the size of the texture map area, in 902 process 60 constructs a ~~normal~~ vector relative to a silhouette edge, in this example, between two end points 62 and 64 of silhouette edge 65 (see Fig. 10). ~~Normal~~-vVector 66 defines the height of the texture map area. In 903, process 60 determines the cross product of ~~normal~~ vector 66 and an eyepoint vector 67. This cross product produces a width vector 69, which defines the direction of the width of the texture map area. The width vector is orthogonal to both ~~normal~~-(height) vector (height) 66 and eyepoint vector 67.

- See pages 5-12 of the present Examiner's Amendment for changes to the claims.
3. Claims 8, 11, 19, 22, 29 and 31-52 are allowed.
 4. The prior art of record fails to teach determining a texture map area comprises: constructing a vector relative to the silhouette edge; determining a cross product of the vector and the eyepoint vector to determine a direction of the width of the texture map area; and defining the texture map area based on points that are positioned relative to end points of the silhouette edge along the direction of the width.
 5. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter-Anthony Pappas whose telephone number is 703-305-8984. The examiner can normally be reached on M-F 10:00am-6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Zimmerman can be reached on 703-305-9798. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Peter-Anthony Pappas
Examiner
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PAP

1 to 7. (Canceled)

8. (Currently Amended) A method of applying a texture map to render a silhouette edge, comprising:

determining ~~a structure of~~ a texture map area based on an eyepoint vector to the silhouette edge, the texture map area having a width and a height, ~~the structure of the~~ texture map area being determined so that the width is orthogonal to the eyepoint vector and to the height; and

applying a texture map to the texture map area to render the silhouette edge;

wherein determining a texture map area comprises:

(i) constructing a vector relative to the silhouette edge;

(ii) determining a cross product of the vector and the eyepoint vector to determine a direction of the width of the texture map area; and

(iii) defining the texture map area based on points that are positioned relative to end points of the silhouette edge along the direction of the width.

9-10. (Canceled)

11. (Original) The method of claim 8, wherein the texture map area is a quadrilateral.

12 to 18. (Canceled)

19. (Currently Amended) An article comprising a machine-readable medium that stores machine-executable instructions for applying a texture map to render a silhouette edge, the instructions for causing a machine to:

determine ~~a structure of~~ a texture map area based on an eyepoint vector to the silhouette edge, the texture map area having a width and a height, ~~the structure of the~~ texture map area being determined so that the width is orthogonal to the eyepoint vector and to the height; and

apply a texture map to the texture map area to render the silhouette edge;

wherein determining a texture map area comprises:

(i) constructing a vector relative to the silhouette edge;

(ii) determining a cross product of the vector and the eyepoint vector to

determine a direction of the width of the texture map area; and

(iii) defining the texture map area based on points that are positioned relative to end points of the silhouette edge along the direction of the width.

20-21. (Canceled)

22. (Original) The article of claim 19, wherein the texture map area is a quadrilateral.

23 to 28. (Canceled)

29. (Currently Amended) An apparatus for applying a texture map to render a silhouette edge, comprising:

a memory which stores computer instructions; and

a processor which executes the computer instructions to

(i) determine ~~a structure of~~ a texture map area based on an eyepoint vector to the silhouette edge, the texture map area having a width and a height, ~~the structure of~~ the texture map area being determined so that the width is orthogonal to the eyepoint vector and to the height, and

(ii) to apply a texture map to the texture map area to render the silhouette edge;

wherein determining a texture map area comprises:

constructing a vector relative to the silhouette edge;

determining a cross product of the vector and the eyepoint vector to

determine a direction of the width of the texture map area;

defining the texture map area based on points that are positioned relative to end points of the silhouette edge along the direction of the width.

30. (Cancelled)

31. (Currently Amended) The apparatus of claim 29 ~~30~~, wherein the texture map area is a quadrilateral.

32. (Original) The method of claim 8, further comprising:
detecting the silhouette edge;
wherein the silhouette edge is rendered in a display format that corresponds to a geometry of a three-dimensional model.

33. (Original) The method of claim 32, wherein rendering comprises:
determining an angle between the silhouette edge and an adjacent silhouette edge; and
selecting the display format for the silhouette edge based on the angle.

34. (Original) The method of claim 33, further comprising displaying the silhouette edge in the display format.

35. (Original) The method of claim 34, wherein the display format comprises the texture map

36. (Original) The method of claim 33, wherein the angle is determined based on the silhouette edge and the adjacent silhouette edge.

37. (Original) The method of claim 33, wherein determining comprises:
determining a dot product of the silhouette edge and the adjacent silhouette edge; and

determining an inverse cosine of the dot product to obtain the angle.

38. (Original) The method of claim 33, wherein a first display format is selected if an absolute value of the angle is less than a value, a second display format is selected if the absolute value of the angle is greater than the value and the angle is positive, and a third display format is selected if the absolute value of the angle is greater than the value and the angle is negative.

39. (Original) The article of claim 19, further comprising instructions that cause the machine to:

detect the silhouette edge;

wherein the silhouette edge is rendered in a display format that corresponds to a geometry of a three-dimensional model.

40. (Original) The article of claim 39, wherein rendering comprises:

determining an angle between the silhouette edge and an adjacent silhouette edge; and

selecting the display format for the silhouette edge based on the angle.

41. (Original) The article of claim 40, further comprising instructions that cause the machine to display the silhouette edge in the display format.

42. (Original) The article of claim 41, wherein the display format comprises the texture map.

43. (Currently Amended) The article of claim 40 ~~20~~, wherein the angle is determined based on the silhouette edge and the adjacent silhouette edge.

44. (Currently Amended) The article of claim 40 ~~20~~, wherein determining comprises:

determining a dot product of the silhouette edge and the adjacent silhouette edge; and

determining an inverse cosine of the dot product to obtain the angle.

45. (Currently Amended) The article of claim 40 ~~20~~, wherein a first display format is selected if an absolute value of the angle is less than a value, a second display format is selected if the absolute value of the angle is greater than the value and the angle is positive, and a third display format is selected if the absolute value of the angle is greater than the value and the angle is negative.

46. (Original) The apparatus of claim 29, wherein the processor executes instructions to:

detect the silhouette edge;

wherein the silhouette edge is rendered in a display format that corresponds to a geometry of a three-dimensional model.

47. (Original) The apparatus of claim 46, wherein rendering comprises:
determining an angle between the silhouette edge and an adjacent silhouette edge; and
selecting the display format for the silhouette edge based on the angle.

48. (Original) The apparatus of claim 47, further comprising displaying the silhouette edge in the display format.


49. (Original) The apparatus of claim 48, wherein the display format comprises the texture map.

50. (Original) The apparatus of claim 47, wherein the angle is determined based on the silhouette edge and the adjacent silhouette edge.

51. (Original) The apparatus of claim 47, wherein determining comprises:
determining a dot product of the silhouette edge and the adjacent silhouette edge; and
determining an inverse cosine of the dot product to obtain the angle.

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52. (Original) The apparatus of claim 47, wherein a first display format is selected if an absolute value of the angle is less than a value, a second display format is selected if the absolute value of the angle is greater than the value and the angle is positive, and a third display format is selected if the absolute value of the angle is greater than the value and the angle is negative.



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